

animals which depend upon the proportion contained in it for the purposes of breathing. On three occasions the authors have observed important consequences arise from the extraordinary diminution of the proportion of oxygen, owing to accidental circumstances. At times they have found the proportion so low as 18, 19 or 20 per cent., and the consequence has been the destruction of the greater part of the fish by asphyxia. On the 18th of June 1835, the greater part of the fish in the Mere perished from this cause; and the same circumstance was observed twice in the pond which first directed their attention to the subject of the memoir*.

Their researches into these phænomena led the authors to investigate also the cause of the rubefaction of water, a circumstance which in all ages has excited the attention of the curious, and which has been often regarded as miraculous or ominous. In all cases they have found that it depends on the presence of Infusoria or microscopic Algæ. These researches have given occasion to much interesting discussion regarding the real nature of certain productions which have been referred by authors, according to their peculiar views, to the animal and vegetable kingdom.

Amongst these, the nature of the red snow of the Arctic regions is investigated, and it is satisfactorily proved to be composed of minute animals. The green snow has already been shown by Messrs. Martius and Bravais to be the same thing in a different state. According to them, the granules are red when young, green when old.

When seen in perfection the production is evidently animal, and is identical with *Trachelomonas volvocina*, Ehrenberg. It is furnished with a single oral appendage. When dead it endures for a long time without much sensible alteration or decay, and is then exactly like a true *Hæmatococcus*.

It is impossible for us to give an analysis of every chapter, which would extend to a considerable length. We must content ourselves with thus indicating the nature of the work, and recommending it to the notice both of botanists and zoologists, as affording ample matter for reflection.

PROCEEDINGS OF LEARNED SOCIETIES.

LINNÆAN SOCIETY.

April 18, 1843.—The Lord Bishop of Norwich, President, in the Chair.

Read the conclusion of Mr. Griffith's memoir "On the Ovulum of *Santalum*, *Loranthus*, *Viscum*," &c.

In this paper, dated "Malacca, March 28th, 1842," Mr. Griffith proposes to supply many of the deficiencies in his two memoirs on the ovula of *Santalum*, *Loranthus* and *Viscum*, published in the 18th vol. of the Society's "Transactions," to correct some important mistakes, and to extend his inquiries to another genus of the natural family of *Santalaceæ*, viz. *Osyris*. With this view he gives a detailed

* Perhaps the periodical or occasional mortality of the fish in the Mere at Diss in Norfolk, when the Mere is said to be *sick*, may be ascribed to the same cause.—ED.

description of the progress of the development of the embryo, so far as he has been enabled to observe it, in *Santalum album*, *Osyris Nepalensis*, *Loranthus bicolor*, *Loranthus globosus* and two species of *Viscum*; each of which subjects is illustrated by an extensive series of microscopical drawings. In connection with these details he proceeds to remark at some length on the four following points:—1. the solidity of the ovarium and the appearance of the ovulum after fecundation, or rather after the action of the pollen on the stigmatic surfaces; 2. the reduction of an ovulum to the nucleus or to the embryonary sac; 3. the embryonary sac; and 4. the origin of the embryo. The following is the summary given by him of his ideas of the structure of *Santalum*, *Osyris*, *Loranthus* and *Viscum*:—

“In *Santalum* the ovulum consists of a nucleus and an embryonary sac, prolonged beyond both the apex and base of the nucleus: the albumen and embryo are developed in the parts above the septum [in the exerted portion of the sac], the parts below and the nucleus remaining unchanged. The embryo is developed from the pollinic vesicle. The seed has no actual proper covering, and no other theoretical covering than the incorporated upper separable parts of the embryo-sac.

“In *Osyris* the ovulum is reduced to a nucleus and an embryonary sac, which is prolonged in the same directions as in *Santalum*, but not to such a degree beyond the apex of the nucleus. The seed is formed outside the embryo-sac, and is absolutely without proper tegument, or whatever covering it may have did not enter into the composition of the ovulum. The embryo appears to be developed at some distance from the anterior end of the pollen tube.

“In *Viscum* the modifications appear to me to be two: in the one an evident cavity exists in the ovarium, and the ovulum appears to be reduced to an embryonary sac hanging from one side of the base of a nipple-shaped or conical placenta. In the other the ovulum is reduced to an embryonary sac, but this is erect, and has no such obviously distinct point of origin as in the first. In both the albumen has no other proper covering than the incorporated embryonary sac; and, at least in the last, the embryo appears to be a direct transformation of the pollinic vesicle.

“In *Loranthus* each ovulum appears to be reduced to an embryonary sac, the albumen is developed either partly within the sac, or entirely, or almost entirely, without it. The embryo is a growth from the ends of the continuations of the pollen tubes outside the anterior ends of the embryo-sacs, and is, in one modification, exemplified by *L. globosus*, up to a certain period exterior even to the albumen. In *L. bicolor* the albumen has no proper tegument; in *L. globosus* it may be supposed to have a partial one in the incorporated albuminous part of the embryo-sac.

“The gradation of structure appears to me to be tolerably complete. One modification of *Viscum*, in my opinion, tends to show that in *Santalum* the first steps towards the disappearance of the usual nucleus take place. *Osyris* seems to me to indicate that a similar tendency may affect the embryonary sac; and *Santalum* appears to me to allude to a reduction in the embryo-sac to the form of that of *Osyris*.

Nor is this all, *Osyris* has its albumen and embryo developed outside that end of the sac to which the pollen tubes are applied: *Loranthus bicolor* has the same developed outside the opposite end of the sac. And the partial development of the albumen in the embryo-sac of *Loranthus globosus* may perhaps be a passage to its development outside that sac in *L. bicolor*.

“The novel points of structure and development pointed out in this paper are, so far as I know, the possibility of the separation of a continuous membranous embryo-sac into two distinct parts, of which the lower remains unchanged, though it would almost appear from *Osyris* to be the most permanent; the presence of the embryo-sac not being necessarily connected with its forming one of the constituent parts of the young or of the mature seed; the longitudinal percussion of the embryo-sac by the pollen tubes; the formation of the albumen either only partially within the embryo-sac, or almost entirely, if not quite so, without it; the confluence of the albumina of several sacs into one albumen; the growth of the embryonic tissues from the continuations of the pollen tubes outside the embryo-sac; the possibility of one embryo resulting from a combination of several pollen tubes, and of its becoming interior to the albumen, although it may have been for some time entirely exterior to it.

“I make no mention of the posterior prolongations of the sacs, in doubt of the true nature or origin of the so-called chalazal apparatus of *Thesium*; or of the growth of the embryonic tissues from the ends of the pollen tubes, in doubt of my having misunderstood the observations of M. Schleiden, and in ignorance of those of M. Wydler.”

In a subsequent note Mr. Griffith notices certain peculiarities in the development of the embryo in *Avicennia*, and in a genus which, notwithstanding its very curious anomalies, he considers referrible to *Santalales*, and to which he gives the following characters:—

MODECCOPSIS.

Calyx superus; limbo minutissimo, 5-dentato. *Petala* 5, disco epigyno inserta, basi utrinque uni-glandulosa. *Stamina* 5, petalis opposita. *Ovarium* omninò inferum, 1-loculare. *Ovula* 3, ex apice loculi! pendula, anatropa! *Stylus* brevis. *Stigmata* 3, subcapitata. *Fructus* subdrupaceus, monospermus, calyce demùm soluto quasi 5-valvis!! *Semen* unicum, pendulum; endocarpio osseo inclusum. *Albumen* copiosum. *Radiculæ* locus superus.

Frutex scandens, cirrhifer, cirrhis axillaribus. Folia alterna, exstipulata, oblongo-ovata, basi subcordata et quinque-venia. Flores minuti, inconspicui. Glandulæ apice piliferæ! Fructus abortu solitarius, cum pedicello clavato-pyriformis; valvæ intùs rubræ.

Habitus *Modeccæ*; *Rhamneis* mediante *Gouaniâ* analoga? *Santalaceis* potiùs affinis.

Hab. in Assamiâ Superiore, Oris Tenasserim, Mergui Provinciâ, Malaccâ.

Anniversary Meeting.

May 24.—The Lord Bishop of Norwich, President, in the Chair.

The President opened the business of the Meeting, and having stated the number of Members whom the Society had lost during

the past year, the Secretary read the following notices of some of them :—

The Rev. James Dalton was educated at Clare Hall, in the University of Cambridge, where he took his Bachelor's degree in 1787, and that of Master of Arts in 1790. He was much attached to botanical pursuits, and well acquainted with our native plants, and especially with the *Carices* and *Mosses*. Among the latter he was the first discoverer of several new species, and his name has been commemorated by Sir W. J. Hooker in a well-known genus. Many of his observations are recorded by Sir James E. Smith in his 'English Botany' and 'English Flora.' He became a Fellow of this Society in 1803; and in 1805 he was presented by the King to the living of Croft in Yorkshire, where he continued to reside until his decease, on the 2nd of January in the present year, at the age of 78.

John Latham, M.D., formerly a physician of considerable eminence and extensive practice, was born at Gawsworth in the county of Chester, Dec. 29, 1761, and educated at Brasen-nose College, Oxford, where he took his Doctor's degree in 1788. In the same year he established himself in London, and became successively physician to the Middlesex, the Magdalen, and St. Bartholomew's Hospitals, and Fellow and President of the Royal College of Physicians. He was elected a Fellow of this Society on the 16th of March 1790, and was consequently its senior member. He died on the 20th of April in the present year at Bradwall Hall, Cheshire, to which place he had retired from the fatigues of practice in 1829. His published works are wholly medical.

John Gage Rokewode, Esq., for many years Director of the Society of Antiquaries, was the fourth and youngest son of Sir Thomas Gage of Hengrave Hall in the county of Suffolk, the sixth baronet of that family, and brother of the late Sir Thomas Gage, also a Fellow of our Society and a botanist of considerable attainments, especially in his knowledge of the family of Lichens. On the death of his second brother, he assumed the name of Rokewode and entered into possession of Coldham Hall and the property belonging to it, in pursuance of a settlement executed in 1728 by one of his ancestors. Mr. Gage Rokewode was devoted from an early period of his life to the study of the antiquities of his native country, to the illustration of which his numerous publications in the 'Archæologia,' in the 'Vetusta Monumenta,' and in various separate works, have greatly contributed.

The Society has also to regret the loss of two of its *Associates*.

Mr. Daniel Cooper, whose sudden and melancholy death was noticed in the 'Annals' for January last; and

Mr. Alexander Matthews, an active and intelligent botanical collector, who died at Chachapoyas on the Andes of Peru, on the 24th of November 1841. He had been engaged for many years in forming and transmitting to Europe collections of Peruvian and Chilian plants; and was the first discoverer of many species of great interest and beauty, which have been described, from the specimens gathered by him, chiefly in Sir W. J. Hooker's various publications, in which also

occasional letters from him on the subject of his botanical pursuits will be found.

At the election which subsequently took place, the Lord Bishop of Norwich was re-elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out: viz. Arthur Aikin, Esq.; Rev. Frederic William Hope; William Horton Lloyd, Esq.; Richard Owen, Esq., and William Yarrell, Esq.

June 6.—Edward Forster, Esq., V.P., in the Chair.

Read the conclusion of Professor Forbes's memoir "On the *Ophiurida* of the Ægean Sea."

The author commences this portion of his paper by a revised character of the genus *Ophioderma* of Müller and Troschel, as follows:—

OPHIODERMA.

Corpus orbiculare, squamosum, granulosum, ad peripheriam radiatum; radiis simplicibus squamosis; disco in radiorum origines prolongato, infra poris genitalibus viginti; squamis radiorum lateralibus adpressis, in marginibus superioribus spiniferis, spinis simplicibus; ossiculis ovarialibus parvis, oralibus pectinatis.

The species on which this genus is founded, *Ophiura lacertosa*, Lam., is stated to be rare in the Ægean Sea, and is thus characterized:—

Oph. lacertosa.

O. radii convexiusculis; squamis superioribus transversè oblongis: lateralibus 8-spiniferis: inferioribus quadratis.

Of the genus *Ophiomyxa* of the same authors, Professor Forbes also gives the following revised character:—

OPHIOMYXA.

Corpus pentagonale, coriaceum, læve, ad peripheriam radiatum; radiis simplicibus, interruptè squamosis; disco in radiorum origines prolongato; squamis radiorum lateralibus spiniferis, spinis serrulatis; ossiculis ovarialibus binis parvis, oralibus spinis serrulatis armatis.

The Ægean species, *O. lubrica*, Forbes, was found in between ten and twenty fathoms water in the sea of the Cyclades.

For a new species not uncommon in the seas of the Archipelago, the author establishes the genus—

OPHIOPSILA, Forbes.

Corpus orbiculare, coriaceum, læve, ad peripheriam radiatum; radiis simpliciter squamosis, infra discum insertis; squamis lateralibus subcarnatis spiniferis, spinis simplicibus; ossiculis ovarialibus parvis, oralibus ad latera nudis.

OPH. ARANEA, Forbes.

Another new genus is constituted for the reception of the long-rayed, scaly and smooth-bodied *Ophiurida*, with simple tentacula and smooth spines, and is characterized as follows:—

AMPHIURA, Forbes.

Corpus orbiculare, squamosum, læve, ad peripheriam radiatum; radiis simplicibus squamosis, infra discum insertis; squamis lateralibus sub-

carinatis spiniferis, spinis simplicibus; ossiculis ovarialibus parvis, oralibus ad latera nudis; cirrhis simplicibus.

Three species inhabit the Ægean Sea, of which one is undescribed. Their characters are thus given:—

A. FLORIFERA, Forbes.

A. disco squamis centralibus maximis rosulatis, scutellis ovatis disjunctis, squamis radiorum superioribus quadratis: inferioribus trilobatis: lateralibus 3-spiniferis; spinis brevissimis linearibus simplicibus.

A. neglecta, Forbes.

A. disco squamis centralibus parvis rosulatis, scutellis oblongis conjunctis, squamis radiorum superioribus quadratis: inferioribus oblongis: lateralibus 4—5-spiniferis; spinis brevibus simplicibus.

Ophiura neglecta, Johnston.

A. Chiajii, Forbes.

A. disco squamis minutis rosulatis, scutellis cuneatis divergentibus apicibus approximatis, squamis radiorum superioribus lenticularibus: inferioribus quadratis sulcatis: lateralibus 4-spiniferis; spinis longis simplicibus.

Ophiura filiformis, Chiaje (nec Müller).

Lastly, the author adopts the genus *Ophiothrix* of Müller and Troschel, with the following revised character:—

OPHIOTHRIX.

Corpus orbiculare, spinosum, ad peripheriam radiatum; radiis simplicibus, squamosis, squamis superioribus imbricatis, lateralibus carinatis spiniferis; spinis serrulatis; ossiculis ovarialibus parvis, oralibus ad latera nudis; cirrhis pinnatis.

Ophiothrix Rosula is common in the Ægean Sea.

Figures are given of all the new genera and species, with numerous magnified details.

BOTANICAL SOCIETY OF LONDON.

Aug. 4, 1843.—J. E. Gray, Esq., F.R.S. &c., President, in the Chair.

Read “Notes on a variety of *Rosa sarmentacea* (Woods) (found near Bridgewater by Mr. Clarke),” by Mr. Edwin Lees, F.L.S. &c.

Mr. Lees had known this variety for some years; and though there was considerable difference in the more or less deeply cut serratures of the foliage, he always found the calyx to be fringed with stalked glands as well as the flower-stalks; the tube is generally but sparingly so, or even naked. It is abundantly covered with glands in this specimen, which is, therefore, a more than usually glandulose variety of *R. sarmentacea*. In some MS. observations on this species made in 1836, Mr. Lees observed:—

“Calyx pinnate, rather densely covered with glandular bristles, which, united to a purplish bloom on their segments as well as on the tube, gives this rose a peculiar and very elegant appearance.”

The petioles are always more or less glandular, without prickles, differing in this respect materially from *R. canina*, as well as in the particulars mentioned above.

Mr. Lees had often observed, that the young foliage of this species

has a faint but very perceptible cowslip-like scent, by which he could always tell it when not in flower, but had never observed this in the leaves of *R. canina*.

Mr. Lees contended for *R. scabriuscula* being a good species, though it must be observed, that the calyx-tube varies in being more or less covered with stalked glands, and therefore Smith is wrong in the 'English Flora' in saying with regard to it, "quite smooth and naked."

The character of the plant as differing from *R. canina* is in the glandulosity of the pinnate calyx and peduncle, and in the petioles being slightly glandular, without prickles, or with very weak ones.

This variety was not, as far as Mr. Lees's observations had gone, abundantly distributed, being somewhat local and plentiful only in particular places.

Read also "Notice of the Mosses found in the neighbourhood of Bristol," by Mr. G. H. K. Thwaites.

The author enumerated 133 species as indigenous to that locality, several of which appear to be new to the British Flora. Amongst those most interesting to the British muscologist may be noticed the following:—

Gymnostomum viridissimum, <i>Sm.</i>	Leucodon sciuroides, <i>Schwæg.</i>
— fasciculare, <i>Hedw.</i>	Bartramia pomiformis, <i>Hedw.</i>
Didymodon Bruntoni, <i>Arn.</i>	Hypnum riparium, <i>L.</i>
— rigidulus, <i>Hedw.</i>	— murale, <i>Hedw.</i>
— crispulus, } <i>Wilson MSS.</i>	— piliferum, <i>Schreb.</i>
— brachydontius, }	— salebrosus, <i>Hoffm.</i>
— flexicaule.	— crassinervum, <i>Wilson.</i>
Bryum albicans, <i>Wahl.</i>	— strigosum ?
— atropurpureum, <i>W. et M.</i>	— circinnatum, <i>Brid.</i>
— cernuum.	— cæspitosum, <i>Sw.</i>
— rostratum, <i>Schrad.</i>	Tetraphis pellucida, <i>Hedw.</i>
Barbula rigida, <i>Hedw.</i>	Eucalypta streptocarpa, <i>Hedw.</i>
— convoluta, <i>Hedw.</i>	Weissia Starkeana, <i>Hedw.</i>
— lævipila.	Trichostomum fasciculare, <i>Schrad.</i>
— cylindrica, <i>Wilson MSS.</i>	— polyphyllum, <i>Schw.</i>
— latifolia, <i>Br. et Sch.</i>	Grimmia orbicularis, <i>Br. et Sch.</i>
Orthotrichum Rogeri, <i>Brid.</i>	Funaria Muhlenbergii, <i>β. patula.</i>
Hookeria lucens, <i>Sm.</i>	

The President drew the attention of the Society to an abnormal form of *Ophrys apifera* which had been sent to him by a lady from Dorking. The two lower flowers of the spike had two distinct united columns, the upper normal one being rather the larger and overlapping the other; the upper flowers had three columns united into a singular triangular mass; the upper petals of each of the flowers were rather reduced. The lip of the two lower flowers was small, and retained in part the usual character of the flower, but the lip of the top flower was lilac, and exactly resembled the sepals in form and colour. The three sepals of the middle flower were united together nearly to the lip, as was the case with two of the sepals of the terminal flowers. The ovaries of all the flowers were of the normal structure. The President stated that the Rev. Gerard E. Smith had

figured an *Ophrys* with a similar triple column, but his specimen was quite destitute of any lip.

The President observed, it might be worth while to examine if this excess of development of the column was always coexistent with the reduced development of the lip.

The President stated that this structure was quite distinct from the monstrosity of this plant described by Mr. Hincks, where each of the three petals was transformed into polleniferous columns.

ZOOLOGICAL SOCIETY.

Nov. 22, 1842.—William Yarrell, Esq., Vice-President, in the Chair.

A communication by Mr. Lovell Reeve, "On the genus *Phorus*, a group of agglutinating Mollusks of the family *Turbinacea*," was read.

"It is remarkable that a group of mollusks of such decided importance as those which I have selected for consideration should have so long escaped the especial notice of conchologists. The genus *Phorus* was introduced many years since by De Montford; but as it was not recognised by Lamarck, few authors thought it worthy of adoption. Little enough is known of the nature or anatomy of the *Phori*, but the remarkable character which their shells exhibit may be sufficiently estimated to rest their claim upon that alone to the rank of a genus.

"The character here alluded to is a property which these mollusks possess of agglutinating to the outer surface of their shells any fragments of stones, shells, corals, or other marine debris that they may chance to be in contact with, and which become so firmly attached that they cannot be dislodged without violence. The well-known Carrier Trochus (*Trochus agglutinans*, Lamarck; *Phorus onustus*, mihi) was for a long time the only species of *Phorus* known; when others even were discovered they were only regarded as varieties of that species, and the agglutinating property which they showed their animal occupants to possess, was not considered to be of any generic importance. The distinction however which De Montford assigned to these animals has become of infinite value, for we now possess several species of them, and the agglutinating power operates in different ways in each; some shells, for example, are found with only a few small pebbles agglutinated to the earlier whorls, whilst others are characterized by their having only such fragments of shells or stones as are flat or tile-shaped collected round the edge or periphery of the whorls; and these several methods of agglutinating are each confined to particular species. Other modifications of this property may yet be discovered, and I trust, as the *Phori* are not uncommon in the West Indies, that they will ere long be made the subject of anatomical examination.

"I see no reason at present for altering the situation which is commonly assigned to these mollusks in the general system; the structure and formation of the shell, as well as the presence of an operculum, seem sufficiently to indicate that they are allied to the *Trochi*, and not to the *Calyptææ*, as supposed by Mr. Gray.

“I now proceed to lay seven species of this interesting genus before the Society, four of which are entirely new to me.”

GENUS PHORUS.

Testa orbicularis, subconica, spirâ obtusâ, anfractibus regularibus, peripheriâ tubulis cavis interdum ornatâ, conchyliorum lapidumque frustis irregulariter agglutinatis; facie infernâ concaviusculâ, granosâ aut lamellosâ; umbilico amplo, profundo, sæpè ætate occultato; aperturâ depressâ, marginibus disjunctis, labro simplici, acuto. Operculum corneum tenue, ovale.

“Such are the characters which appear to me to apply generically to this group. The specific differences consist, not in the nature of the materials which are agglutinated, as supposed by Born and others, who had their *Trochi lithophorus* and *conchyliophorus*, for stones, shells and corals may often be found collected on the same individual; but in the perpetuated variations of the living shell, and the manner in which the surrounding debris become attached to it.”

PHORUS SOLARIS. *Phor. testâ orbiculari, subconicâ, paucis calculis versus apicem agglutinatis; apice acuto; superficie striis obliquis et undulatis inscriptâ; anfractibus tubuloso-radiatis, tubulis tenuibus cavis, apertis; infernâ facie plano-concavâ, undulatim striatâ; aperturâ semicordatâ; umbilico angustâ.*

Reeve, Conch. Syst., vol. ii. pl. 214. f. 1 and 2; Conch. Icon. Phorus, pl. 2. f. 5 a and b.

Trochus solaris, Linnæus, Lamarck, &c.

Hab. Malacca. (Found in coarse sand at the depth of seven fathoms.) Cuming.

“This very beautiful shell, in which the periphery of the whorls is extended throughout into hollow spouted spines, has never more than a few pebbles agglutinated to the first one or two whorls. The finest specimen I know of is in the collection of the Rev. Mr. Stainforth, and has furnished me with the drawing above referred to.”

PHORUS ONUSTUS. *Phor. testâ orbiculari, conicâ, brunnescente-albâ; anfractibus subangulatis, rudibus, vel conchyliis vel lapidibus agglutinatis; infernâ facie subconcavâ, rufâ; umbilico ætate occultato.*

Reeve, Conch. Syst., vol. ii. pl. 214. f. 3, and 215. f. 8; Conch. Icon. Phorus, pl. 1. f. 3 a and b.

Trochus agglutinans, Lamarck.

Trochus conchyliophorus,
Trochus lithophorus, } auctorum.

Hab. West Indies.

This is the original and best known species of the group; it is by far the most profusely covered, and is generally heavily laden with shells, stones, or corals.

PHORUS INDICUS. *Phor. testâ orbiculari, convexo-conicâ, ad apicem acutâ, tenuissimâ, subtilissimè striatâ, albâ, supernè rosed; anfractuum peripheriâ dilatatâ, acutissimâ; infernâ facie profundè umbilicatâ, fusco-fasciatâ, lamellâ laterali cavitatem formante.*

Reeve, Conch. Syst., vol. ii. pl. 215. f. 6; Conch. Icon. Phorus, pl. 1. f. 2.

Trochus Indicus, Gmelin, Lamarck.

Wagner, Supp. to Chemnitz, p. 129. pl. 229. f. 4062 *a, b*.

Hab. Cochin-China.

“I never remember having seen this shell with any shells or pebbles attached to it, but the first two or three whorls sufficiently indicate that some have been agglutinated to it at one time or another by the numerous indentations which they exhibit. The under surface of the shell is generally marked with a circular brown band, the centre being widely umbilicated.”

PHORUS EXUTUS. *Phor. testâ orbiculari, depresso-conicâ, ad apicem acutâ, rosaceo-fulvâ, tenuissimâ, volutâ peripheriâ inconcinniter undulatâ, dilatâ, superficîe diagonaliter striatâ et sulcatâ; infernâ facîe pallidâ, nitente, striatâ, versus marginem granosâ, lamellâ cavitatem formante.*

Reeve, Conch. Syst., vol. ii. pl. 215. f. 9 and 10; Conch. Icon. Phorus, pl. 2. f. 7 *a* and *b*.

Hab. — ?

“This shell exhibits very slight evidence of ever having had any matter agglutinated to it. It somewhat resembles the preceding species, but may be readily distinguished by the elaborate manner in which the whorls are diagonally carved with grooves and striæ. The periphery of each whorl is most unusually dilated beyond their laminal bases; it is exceedingly thin and fragile, and very unevenly undulated.”

PHORUS CALCULIFERUS. *Phor. testâ orbiculari, convexo-conicâ, tenui, subtilissimè granosâ et striatâ, volutis calculis et conchyliorum frustis supernè symmetricè ornatis; facîe infernâ profusè granosâ et striatâ.*

Reeve, Conch. Syst., vol. ii. pl. 215. f. 7; Conch. Icon. Phorus, pl. 1. f. 1.

Hab. — ?

“I have seen several specimens of this very pretty species; the shell is of a bright subrosaceous fawn-colour, and entirely covered with fine diagonal striæ and cross grains. The agglutinating property seems confined to the upper portion of the whorls, so that there is always a band of fine pebbles or shells around the sutures, and they exhibit a regular increase in their selection as the agglutinating surface increases with the growth of the shell.”

PHORUS PALLIDULUS. *Phor. testâ solidâ, albâ, acutissimè pyramidalî, volutis angulatis conchyliorum frustis sparsis agglutinatis; infernâ facîe leviter concavâ, pallidulâ, subtilissimè striatâ.*

Reeve, Conch. Syst., vol. ii. pl. 214. f. 4; Conch. Icon. Phorus, pl. 1. f. 4.

Hab. Coast of Japan: Siebald.

This shell is most nearly allied to the *Phorus onustus*; it is very solid, sharply pyramidal, and of a singular live pallid appearance. There are two or three specimens of it in the collection of H. Cuming,

Esq.; and the fragments of shells which are agglutinated indiscriminately to the area of the whorls are very much broken in all, though the shells to which they are agglutinated are in every respect live and perfect.

PHORUS CORRUGATUS. *Phor. testâ orbiculari, obeso-conicâ, albâ, diagonaliter corrugatâ, volutarum peripheriâ conchyliorum lapideumque frustis planis ornatâ; facie infernâ pallidâ, leviter granosâ et striatâ.*

Reevé, *Conch. Syst.*, vol. ii. pl. 214. f. 5; *Conch. Icon.* Phorus, pl. 2. f. 6.

Hab. —?

The method or disposition of the agglutinated fragments in this species is very peculiar and distinct from that in any other. The generic property is here confined to the base of the whorls, and the fragments which become attached are all inserted edgewise, ranging with great regularity side by side. The specimen above described is in the collection of the Rev. Mr. Stainforth.

Mr. Cuming exhibited to the Meeting the various species of *Phorus* referred to in the above communication, and also a series of specimens of the genus *Pecten*, descriptions of which, by G. B. Sowerby, Jun., were read. The species described are figured in Sowerby's 'Thesaurus Conchyliorum.'

PECTEN PICTUS, *Thes. Conch.* pl. 20. f. 233. *Pect. T. obliquè ovatâ, compressâ; auriculis subæqualibus, radiatim sulcatis, ad basim emarginatis, ad margines undulatis; lateribus striatis; costis 13, triangulatis, elevatis, levibus; interstitiis angustis, bisulcatis, crenatis; colore pallidè fulvo, fasciis et punctis et lineis rubris variegato; intus albo.* Long. 0·80; lat. 0·25 poll.

Hab. Ins. Baïæ, Ins. Negros, Philippinarum. H. Cuming legit. Found in coarse sand at a depth of seven fathoms.

Equivalve, nearly equilateral, flat, with thirteen nearly triangular ribs, slightly flattened at the upper angle; the ears nearly equal, and the general characters of the species indicating some degree of affinity with the group containing *P. Radula*.

PECTEN SUPERBUS, *Thes. Conch.* pl. 12. f. 11. *Pect. T. subovali, obliquâ, posticè expansâ, compressâ, crassâ; auriculis parvis, obtusis; costis 23, crassis, rotundatis, levibus, interstitiis angustis; colore propè umbones roseo, propè margines pallidè luteo, fasciis rubris, præruptis, angulatis variegato.* Long. 2·40; lat. 0·65; alt. 2·60 poll.

Hab. —? Mus. H. Cuming.

Flat, solid, obliquely oval, with the auricles small, obtuse; twenty-three rounded, smooth, thick ribs; the general colour pale straw, pink at the umbones, variegated with interrupted angular bands of brightish red.

PECTEN VELUTINUS, *Thes. Conch.* pl. 13. f. 31. *Pect. T. subovali, subcompressâ, æquilaterali, radiatim leviter striatâ, ad marginem subinflatâ; auriculis subæqualibus, striatis, margine obliquè pli-*
Ann. & Mag. N. Hist. Vol. xii. Q

cato; *costis* 5, *crassis*, *rotundatis*, *gradatim declinantibus*; *colore fulvo-rufescente*, *fasciis albis*, *angulatis*, *subtùs fusco-marginatis variegato*; *intùs albo*. Long. 1.15; lat. 0.37; alt. 1.25 poll.

Hab. Macassar. Hinds legit.

Nearly oval, rather flat, equilateral, with fine radiating striæ; auricles nearly equal, striated; hinge obliquely plicated; ribs five, rounded, not very deep; colour dull fawn, variegated with angular bands of white edged with brown lines. The whole surface of the shell has a somewhat velvety appearance.

PECTEN SERRATUS, Thes. Conch. pl. 13. f. 56. *Pect. T. obliquè ovali*, *irregulari*, *posticè subproductâ*, *subcompressâ*; *auriculis inæqualibus*, *posticis minoribus*, *costis numerosis*, *minutissimè squamiferis*; *colore sulphureo*, *maculis magnis fuscis variegato*, *intùs ad marginem purpureo*. Long. 1.20; lat. 0.50; alt. 1.40 poll.

Hab. ad Insulas Philippinas. H. Cuming legit. Found under stones at low water on the island of Zebu.

Resembling *P. squamosus*, but more oblique and more ventricose, with the scales more minute.

PECTEN ALBOLINEATUS, Thes. Conch. pl. 14. f. 69. *Pect. T. ovali subtrigondâ*, *compressâ*, *æquivalvi*; *auriculis inæqualibus*, *posticis minimis*, *anticis magnis*, *acutis*, *sulcatis*; *costis numerosis*, *æqualibus*, *subquadratis*; *interstitiis griseo-maculatis*, *valvæ sinistra costis griseis*, *lineis albis interruptis*, *costarum tribus albis*. Long. 0.93; lat. 0.25; alt. 1.19 poll.

Hab. Ins. Guimaras, Philippinarum. Found under stones at low water.

Resembling *P. ornatus*, Lam., but with the ribs more numerous, equal and regular.

PECTEN SINGAPORINUS, Thes. Conch. pl. 13. f. 151, et pl. 18. f. 71. *Pect. T. rotundatâ*, *subtrigondâ*, *subcompressâ*, *æquivalvi*, *subæquilaterali*, *subtenui*; *auriculis inæqualibus*; *anticis magnis*; *costis* 24 *elevatis*, *subquadratis*, *lævibus*; *colore albo*, *pallidè roseo tincto*, *radiis quatuor latis*, *fusco-maculatis*; *prope umbones griseo maculato*. Long. 1.30; lat. 0.40; alt. 1.30 poll.

Hab. Singapore. Found in coarse sand at the depth of six fathoms. More depressed spreading and circular than *P. Tranquebaricus*.

PECTEN CRASSICOSTATUS, Thes. Conch. pl. 15. f. 111. pl. 17. f. 152. *Pect. T. subtriangulari*, *crassâ*, *subæquilaterali*, *sublævi*; *auriculis inæqualibus*, *costas squamiferas ferentibus*; *costis* 24, *crassis*, *elevatis*, *subquadratis*, *annulatis*; *lateralibus squamiferis*; *interstitiis ferè lævibus*, *colore pallidè purpureo*, *vel aurantiaco*. Long. 4.50; lat. 1.50; alt. 4.30 poll.

Hab. Japan. Mus. H. Cuming.

A much larger and more solid shell than *P. senatorius*, with the ribs much more elevated and more square.

PECTEN SPLENDIDULUS, Thes. Conch. pl. 20. f. 246. *Pect. T. ovali*, *subtrigondâ*, *tenui*, *compressâ*, *ad latera angulatâ*; *auriculis valdè inæqualibus*, *squamoso-sulcatis*, *complanatis*; *anticis latis*, *elonga-*

tis; *sinu magno*; *costis 25, concinnis, subdistantibus, rotundato subquadratis, squamas acutas erectas, distantes ferentibus*; *colore rubro, maculis albis elongatis, ad auricula lateraque fasciatim variegato*. Long. 1.20; lat. 0.35; alt. 1.35 poll.

Hab. Singapore. Mus. H. Cuming. Found at a depth of six fathoms in coarse sand.

A much more compressed and regularly-formed shell than *P. varius*.

PECTEN PSEUDOLIMA, Thes. Conch. pl. 20. f. 235. *Pect. T. rotundato-ovali, subobliquâ, subæquivalvi, ventricosâ; auriculis inæqualibus, squamoso-sulcatis; anticis elongatis, acutis, valvæ dextræ ad marginem spinosis; posticis parvis obtusis; costis 27, crassiusculis, bisulcatis, subrotundatis, squamarum acutarum series tres ferentibus; interstitiis angustis planis; colore aurantiaco, albo (præcipuè ad umbones) variegato.*

Hab. Jacna, ad Ins. Bohol, Philippinarum. H. Cuming legit.

The ribs are beautifully ornamented by three rows of close, sharp, erect, slightly curved scales.

Mr. Sowerby also characterized a new species of *Rostellaria*.

ROSTELLARIA CURTA, Thesaurus Conchyliorum, part i. pl. 5. f. 7. *Rost. testâ crassâ, lævi, fusiformi; apice leviter plicatâ; anfractibus numerosis planis; canali postico super anfractûs penultimæ partem decumbenti; canali antico brevi, recto; labio interno crasso; labio externo subexpanso, dentibus sex irregularibus; colore fulvo, fasciâ latâ castaneâ partem posticam anfractuum decurrente.*

Hab. —? Mus. Cuming.

The whorls of this species are flatter than in *Rostellaria curvirostrum*; the last whorl is much shorter and the anterior canal is straight. The outer lip being irregular, led me at first to suppose that the specimen from which the description is taken might be one of the common species in which the completed aperture had been prematurely formed, it being well known that *R. curvirostrum*, in a young state, has the beak straight. But a slight difference in the shape of the whorls, the broad chestnut bands on the upper part of them, and the fact of several other specimens precisely similar having been seen by Mr. Cuming at Berlin, have determined me to describe this as a new species, which I now do with little hesitation.

Mr. Gould exhibited a new species of Parrot belonging to the genus *Coryphilus*, which he characterized as follows:—

CORYPHILUS DRYAS. *Cor. vittâ frontali metallicè viridi, cærulescente verticem versus; hujus plumis elongatis et saturatè cæruleis; dorso et alis obscurè viridibus, uropygio, caudæ tectricibus, et crisso pallidè viridibus, caudæ reatricibus albis, marginibus pallidè virenscenti-cæruleo tinctis; loris albis, pectore vittâ saturatè cæruleâ ornato; abdomine albo, femoribus saturatè cæruleis.*

A band of verditer-green crosses the forehead, changing into blue towards the crown, the feathers of which are lengthened and of a deep blue, with a narrow line of shining paler blue down the centre of each; back and wings dull verditer-green; rump, upper and under

tail-coverts light verditer-green; primaries black, margined on the outer webs with deep greenish blue; tail-feathers white, gradually passing into pale greenish blue on their margins, and the shafts brown; lores white; throat and front of the neck deep blue, each feather with a spot of white at the tip; breast crossed by a band of deep blue; abdomen deep blue, each feather largely tipped with white; thighs deep blue; bill dark horn-colour; feet yellowish white.

Total length, $7\frac{1}{4}$ inches; bill, $\frac{7}{16}$; wing, $4\frac{3}{4}$; tail, $3\frac{1}{4}$; tarsi, $\frac{1}{2}$.

Hab. The Marquesas Islands.

From the indistinct character of the markings of the throat and abdomen, the bird from which the above description was taken would appear to be somewhat immature.

Mr. H. E. Strickland then communicated to the Meeting a list of the Birds in the Chinese collection now exhibiting at Hyde Park Corner:—

“In the present very imperfect state of our knowledge of Chinese zoology, any contribution, however small, becomes valuable, and I have therefore thought it worth while to draw up as accurate a list as I can of the species of birds contained in the very interesting collection of Chinese productions now exposed to public view. Most of the species enumerated exist also in the British Museum, where the kindness of Mr. G. R. Gray has aided me in identifying them.”

N.B. The Nos. refer to the printed catalogue and to the specimens.

Case 19, No. 374. *Euplocamus nycthemerus*, (Linn.)*

375 & 376. *Polyplectron Hardwickei*, Gray.

377 & 378. *Thaumalea picta*, (Linn.)

379. *Paradisea sanguinea*, Shaw.

380 & 382. *Paradisea apoda*, Linn.

381. *Cicinnurus regius*, (Linn.)

383. *Cygnopsis cygnoides*, (Linn.)

Case 21, Nos. 385 & 386. *Phasianus torquatus*, Gm. This is the true wild Ring-necked Pheasant indigenous to China. The Ring-necked Pheasants sometimes shot in this country are supposed to be a mixed breed between this species and *P. colchicus*.

387. *Aix galericulata*, (Linn.)

388. *Oriolus chinensis*, Linn.

389. *Arborophila sphenura*, (Gray.)

390. *Acridotheres cristatellus*, (Gm.)

391. *Lanius erythronotus*, Gould.

392. *Centropus*. Several of the Asiatic species of this genus are as yet so imperfectly determined that I do not venture to affix a specific name to this bird.

393. *Ceryle varia*, Strickl. This, which is the Eastern representative of the *C. rudis* of Europe and Africa, is distinguished by the round black spots on the throat and the greater amount of white on the upper parts.

* The brackets () imply that the authority refers to the *specific names only*.

394. *Gallinula gularis*, Horsf.
 395. *Coturnix communis*, Bonn.
 396. *Fuligula cristata*, Steph.
 Case 22, Nos. 398 & 399. *Rollulus cristatus*, (Gm.)
 400 & 401. *Gallus bankiva*, Temm.
 402. *Turnix pugnax*, (Temm.)
 403. *Acridotheres ialla*, (Horsf.)
 404. *Palæornis bengalensis*, (Gm.)
 405. *Acridotheres sericeus*, (Gm.) This species is quite distinct from *A. dauricus*, Pall., with which it is united by Wagler.
 406. *Hæmatornis jocosus*, (Linn.)
 407. *Merops philippinus*, Linn.
 408. *Palæornis torquatus*, Vig.
 409. *Amadina punctularia*, (Linn.)
 410 & 411. *Amadina oryzivora*, (Linn.)
 412. *Pyrrhulauda gingica*, (Gm.) (*Fringilla cruciger*, Temm.)
 413. *Merops viridis*, Linn.
 414. *Acridotheres malabaricus*, (Gm.)
 415. *Palæornis torquatus*, Vig. Female.
 416. *Amadina malacca*, (Linn.)
 417. *Hydrophasianus sinensis*, (Gm.)
 418. *Psittacus sinensis*, Gm.
 419. *Anser albifrons*, (Gm.)
 420. *Phalacrocorax*. An immature specimen, apparently identical with *P. carbo*, (Linn.) of Europe.
 423. *Xema*, apparently referable to *X. ridibundum*, (Linn.)
 424. *Rhynchaspis clypeata*, (Linn.)
 There are also in Case 22, but without numbers, the two following: *Porzana rubiginosa*, (Temm.), and *Rallus gularis*, Horsf.
 Case 51, Nos. 862 and 863. *Francolinus perlatus*, (Gm.)
 864. *Querquedula falcaria*, (Pall.)
 866. *Coturnix chinensis*, (Linn.)
 867. *Lanius lucionensis*, (Linn.)
 868. *Ianthocincla canora*, (Linn.)
 869 & 875. *Coccothraustes melanurus*, (Gm.)
 870 & 871. *Pyrgita rutilans*, (Temm.)
 872 & 873. *Psittacula galgula*, (Linn.)
 874. Apparently the young of *Melophus Lathamii*, Gray.
 876. *Turdus*, apparently referable to *T. merula*, Linn., fem.
 877. *Gallinula chloropus*, (Linn.)
 878. *Gallinula phænicura*, (Gm.)
 879. *Dafila acuta*, (Linn.)
 880. *Calenas cruenta*, (Gm.)
 Case 52, No. 884. *Querquedula formosa*, (Georgi.)
 885. *Coturnix communis*, Bonn.
 886. *Anthus*. This genus is at present imperfectly worked out, and it is therefore difficult to attach a specific name accurately to the above specimen.
 887. *Herodias garzetta*, (Linn.)
 888. *Oriolus chinensis*, Linn.

889. *Asio brachyotus*, (Linn.)
 890. *Halcyon atricapilla*, (Gm.)
 891. *Copsychus longirostris*, (Swains.)
 892. *Carduelis sinica*, (Linn.) (*Fringilla kawariba*, Temm.)
 893. *Melophus Lathamii*, Gray.
 894. *Gallinula phœnicura*, (Gm.)
 895. *Liothrix sinensis*, (Gm.)
 896. *Yunx torquilla*, Linn.
 897. *Mareca penelope*, (Linn.)
 898. *Querquedula crecca*, (Linn.)
 Case 54, Nos. 917 and 921. *Argus giganteus*, Temm.
 918 & 920. *Turtur suratensis*, (Gm.)
 919. *Acridotheres tristis*, (Linn.)
 922. *Palæornis malaccensis*, (Gm.)

“The birds above enumerated were obtained by Mr. Dunn during his residence at Canton. Some of them appear to have been imported thither from Malacca, and the remainder form but a small sample of the zoological treasures that might be obtained were the Chinese Empire opened to naturalists. It seems strange that so little has yet been done to obtain specimens of Chinese zoology through the medium of the natives. Thousands of bird-skins are annually sent to Europe by the natives of Brazil, Senegal and Malacca, and there can be no reason why a similar trade should not be established with China. All that the Chinese want is a little instruction in the art of preserving specimens, which might be easily communicated if some of the merchants connected with the tea-trade would take an interest in the subject.”

H. E. S.

ROYAL SOCIETY.

March 30, 1843.—“Researches into the Structure and Development of a newly discovered parasitic Animalcule of the Human Skin, the *Entozoon folliculorum*.” By Erasmus Wilson, Esq., Lecturer on Anatomy and Physiology at the Middlesex Hospital.

While engaged in researches on the minute anatomy of the skin and its subsidiary organs, and particularly on the microscopical composition of the sebaceous substance, the author learned that Dr. Gustow Simon* of Berlin had discovered an animalcule which inhabits the hair follicles of the human integument, and of which a description was published in a memoir contained in the first Number of Müller's Archiv for 1842. Of this memoir the author gives a translation at full length. He then states that, after careful search, he at length succeeded in finding the parasitic animals in question, and proceeded to investigate more fully and minutely than Dr. Simon had done the details of their structure, and the circumstances of their origin and development. They exist in the sebaceous follicles of almost every individual, but are found more especially in those persons who possess a torpid skin; they increase in number during sickness, so as in general to be met with in great abundance after

* See a notice of Dr. Simon's paper in this Journal, vol. x. p. 49.

death. In living and healthy persons, from one to three or four of these entozoa are contained in each follicle. They are more numerous in the follicles situated in the depression by the side of the nose; but they are also found in those of the breast and abdomen, and on the back and loins. Their form changes in the progress of their growth. The perfect animal presents an elongated body, divisible into a head, thorax, and abdomen. From the front of the head proceed two moveable arms, apparently formed for prehension: and to the under side of the thorax are attached four pairs of legs, terminated by claws. The author distinguishes two principal varieties of the adult animal; the one remarkable for the great length of the abdomen and roundness of the caudal extremity; whilst the other is characterized by greater compactness of form, a shorter abdomen, and more pointed tail. The first variety was found to measure, in length, from the one-100th to the 45th, and the second, from the one-160th to the 109th part of an inch.

The author gives a minute description of the ova of these entozoa, which he follows in the successive stages of their development. The paper is accompanied by numerous drawings of the objects described.

April 6.—“On the Structure and Developement of the Nervous and Circulatory Systems, and on the existence of a complete Circulation of the Blood in Vessels in the Myriapoda and the Macrourous Arachnida.” By George Newport, Esq.

This paper is the first of a series which the author proposes to submit to the Royal Society on the comparative anatomy and the developement of the nervous and circulatory systems in articulated animals. Its purpose is, in the first place, to investigate the minute anatomy of the nervous system in the Myriapoda and the Macrourous Arachnida, and more especially with reference to the structure of the nervous cord and its ganglia; and thence to deduce certain conclusions with respect to the physiology of that system and the reflex movements in vertebrated animals; secondly, to demonstrate the existence of a complete system of circulatory vessels in the Myriapoda and Arachnida; and thirdly, to point out the identity of the laws which regulate the developement of the nervous and circulatory systems throughout the whole of the Articulata, and the dependence of these systems on the changes which take place in the muscular and tegumentary structures of the body, as, in a former paper, he showed was the case with regard to the changes occurring in the nervous system of true insects.

The first part of the paper relates to the nervous system. A description is given of this system in the Chilognatha, which the author was led, by his former investigations, to regard as the lowest order of the Myriapoda, and approximating most nearly to the Annelida. He traces the different forms exhibited by the nervous system in the principal genera of that order, the most perfect of which are connected on the one hand with the Crustacea, and on the other with true insects. Passing from these to the Geophili, the lowest family of the Chilopoda, which still present the vermiform

type, the nervous system is traced to the tailed Arachnida, the Scorpions, through Scolopendra, Lithobius and Scutigera; the last of which tribes connects the Myriapoda on the one hand with the true insects, and on the other with the Arachnida. The brain and the visceral nerves, the coverings and structure of the cord and ganglia, and the distribution of the systemic nerves are examined in each genus, but more particularly in the Scorpion, in which the nerves of the limbs are traced to the last joints of the tarsi, and those of the tail to the extremity of the sting. Especial attention is bestowed on the structure of the cord and its ganglia, and their development during the growth of the animal. In the lowest forms of the Iulidæ, in which the ganglia are very close together, and hardly distinguishable from the non-ganglionic portions of the cord, the author has satisfactorily traced four series of fibres, a superior, and an inferior one, and also a transverse and a lateral series. The superior series, which he formerly described in insects as the motor tract, he has assured himself is distinct from the inferior, which he regarded as the sensitive tract; this evidently appears on examining the upper and under sides of a ganglionic enlargement of the cord. On the upper surface the direction of the fibres is perfectly longitudinal; while the fibres on the under surface are enlarged, and curvilinear in their direction. But he remarks that it is almost impossible to determine by experiment whether these structures are separately motor and sensitive, as formerly supposed, or whether they both administer to these functions by an interchange of fibres. These two series appear also to be separated in each ganglionic enlargement of the cord by the third series, constituting the transverse or commissural fibres, which pass transversely through the ganglia, and of which the existence was first indicated by the author in his paper on the *Sphinx ligustri*, published in the Philosophical Transactions for 1834. The author states that, in addition to these, there is in each half of the cord another and more important series of fibres, which constitute a large portion of the cord, but of which the existence has hitherto entirely escaped observation. This series forms the lateral portion of each half of the cord, and differs from the superior and inferior series in the circumstance, that while those latter series are traceable along the whole length of the cord to the subœsophageal and cerebral ganglia, the former series extends only from the posterior margin of one ganglion to the anterior margin of the first or second beyond it; thus bounding the posterior side of one nerve and the anterior of another, and forming part of the cord only in the interval between the two nerves. From this circumstance, the author designates the fibres of this series, *fibres of reinforcement of the cord*. Every nerve proceeding from a ganglionic enlargement is composed of these four sets of fibres, namely, an upper and an under one, communicating with the cephalic ganglia; a transverse or commissural, which communicates only with corresponding nerves on the opposite side of the body; and a lateral set, which communicates only with nerves from another ganglionic enlargement on the same side of the body, and which forms part of the cord in the interspace between the gan-

glia. The author had long suspected that this latter set of fibres existed; but he had never, until lately, ascertained their presence by actual observation. Their action seems fully to account for the reflected movements of parts both anterior and posterior to an irritated limb; as that of the commissural set does the movements of parts situated on the opposite side of the body to that which is irritated. In the ganglia of the cord in *Iulus* and *Polydesmus*, the fibres of the inferior longitudinal series are enlarged and softened on entering the ganglion, but are again reduced to their original size on leaving it; thus appearing to illustrate the structure of ganglia in general. In the development of the ganglia and nerves in these genera, and also in *Geophilus*, the same changes take place as those which were formerly described by the author as occurring in insects; namely, an aggregation of ganglia in certain portions of the cord, and shifting of the position of certain nerves, which at first exist at ganglionic portions of the cord, but afterwards become removed to a non-ganglionic portion. The nervous cord is elongated, in order that it may keep pace with the growth of the body, which is periodically acquiring additional segments: that this elongation takes place in the ganglia is proved by these changes of position in the nerves lying transversely across the ganglia. The author infers from these facts, that the ganglia are centres of growth and nourishment, as well as of reflex movements, and that they are analogous to the enlargements of the cord in the vertebrata.

A series of experiments on the *Iulus* and *Lithobius* are next related; the result of which shows that the two supra-œsophageal ganglia are exclusively the centres of volition, and may therefore strictly be regarded as performing the functions of a brain: so that when these ganglia are injured or removed, all the movements of the animal are of a reflex character. When, on the other hand, these ganglia are uninjured, the animal movements are voluntary, and there exists sensibility to pain: there is, however, no positive evidence that the power of sensation does not also reside in the other ganglia.

The second part of the paper relates to the organs of circulation. In all the *Myriapoda* and *Arachnida* the dorsal vessel or heart is divided, as in insects, into several compartments, in number corresponding to the abdominal segments. Its anterior portion is divided, immediately behind the basilar segment of the head, into three distinct trunks. The middle portion, which is the continuation of the vessel itself, passes forwards along the œsophagus, and is distributed to the head itself; while the two others, passing laterally outwards and downwards in an arched direction, form a vascular collar round the œsophagus, beneath which they unite in a single vessel, as was first noticed by Mr. Lord in the *Scolopendra*. This single median vessel lies above the abdominal nervous cord, and is extended backwards throughout the whole length of the body as far as the terminal ganglia of the cord, under which it is subdivided into separate branches accompanying the terminal nerves to their final distribution. Immediately anterior to each ganglion of the cord, this vessel gives off a pair of vascular trunks; and each of these trunks is di-

vided into four arterial vessels, one of which is given to each of the principal nerves proceeding from the ganglion, and may be traced along with it to a considerable distance. Of these, the vessel situated most posteriorly is again connected with the great median trunk by means of a minute branch, so that the four vessels on each side form, with their trunks, a complete vascular circle above each ganglionic enlargement of the cord. Besides these, which may be regarded as the great arterial trunk and vessels conveying the blood directly from the anterior distribution of the heart to the limbs and inferior surface of the body, the author has also discovered a pair of large arterial vessels in each segment, originating directly from the posterior and inferior surface of each chamber of the heart. These vessels he has named *the systemic arteries*; and in the Scolopendra he has traced them from the great chamber of the heart, which is situated in the penultimate segment of the body, to their ultimate distribution and ramification in the coats of the great hepatic vessels of the alimentary canal.

After the blood has passed from the arteries, it is returned again to the heart in each segment of the body by means of exceedingly delicate transparent vessels, which pass around the sides of the segments and communicate with the valvular openings of each chamber of the heart at its upper surface, where the valvular openings are situated, not only in all the Myriapoda, but also in the Scorpionidæ. In Scorpions, the circulatory system is more complete and important than even in the Myriapoda. The heart, divided as in Myriapods into separate chambers, is lengthened out at its posterior extremity into a long caudal artery, and gives off a pair of systemic arteries from each chamber, precisely as in the Myriapoda. These arteries not only distribute their blood to the viscera, but send their principal divisions to the muscular structures of the inferior and lateral parts of the body, as well as to the pulmonary sacs. At the anterior part of the abdomen, the heart becomes aortic, descends suddenly into the thorax, and immediately behind the brain spreads out into several pairs of large trunks, which are given to the head, and to the organs of locomotion. The posterior of these trunks form a vascular collar around the œsophagus, beneath which they unite, anteriorly, to a strong bony arch in the middle of the thorax, to form the great arterial trunk, or supra-spinal vessel, which conveys the blood to the posterior part of the body, as in the Myriapoda. This vessel passes beneath the transverse bony arch of the thorax, and is slightly attached to it by fibrous tissue, which circumstance probably induced Professor Müller, who observed this structure in 1828, to regard it as a ligament. In its course backwards, along the nervous cord, this vessel is gradually lessened in size, until it arrives at the terminal ganglion of the cord in the tail, where it is divided into two branches, which take the course of the terminal nerves, and these are again subdivided before they arrive at their ultimate distribution. In addition to these parts, the author found a hollow fibrous structure, which closely surrounds the cord and nerves immediately after they have passed beneath the arch of the thorax. From the

sides of this structure there pass off backwards two pairs of vessels, that get beneath the peritoneal lining of the abdominal cavity and are distributed on the first pair of branchiæ. A small vessel also passes backwards beneath the cava, and, being joined by anastomoses from the spinal artery, form the commencement of a vessel which the author formerly described in the 'Medical Gazette' as the *subspinal vessel*. This vessel, extending along the under surface of the nervous cord, communicates directly, by short vessels, with the supra-spinal artery, and gives off, at certain distances from its under surface, several large vessels, which unite with others that convey the blood which has circulated through the abdominal segments, directly to the branchiæ, whence it is returned to the heart by many minute vessels that originate from the posterior internal part of each branchia, and, united into single trunks, pass around the sides of the segments to the valvular openings on the dorsal surface of the heart. In the tail of the Scorpion there is a direct vascular communication between the caudal artery and the subspinal vein, which, from the direction of the vessels, induces a belief that there is some peculiarity in the circulation of the blood in this part of the body. Besides these vessels, the author found an arterial trunk that originates from the commencement of the aorta as it descends into the thorax. This vessel passes backwards along the alimentary canal, to which it is distributed, and gives off branches to the liver.

This paper is accompanied by five drawings, illustrating the anatomical facts which are described in it.

May 11.—“Note regarding the Observations of T. Wharton Jones, Esq., F.R.S., ‘On the Blood Corpuscles.’” By Martin Barry, M.D., F.R.S. L. & E.*

The author observes, that the structure of the blood-corpuscles can be accurately learned only by a careful investigation of their mode of origin, and by following them through all their changes in the capillary vessels, and especially in the capillary plexuses and dilatations, where all their stages of transition from the colourless to the red corpuscles may be seen. The filament which forms here and there in the corpuscles of coagulating blood he has shown to other persons, with Microscopes made by Ross and Powell. Dr. Barry denies that he meant certain general remarks in his paper, referring to more than twenty delineations of corpuscles from various animals, to apply exclusively to those of man.

May 25.—“On the Respiration of the Leaves of Plants.” By William Haseldine Pepys, Esq., F.R.S.

The author gives an account of a series of experiments on the products of the respiration of plants, and more particularly of the leaves; selecting, with this view, specimens of plants which had been previously habituated to respire constantly under an inclosure of glass; and employing, for that purpose, the apparatus which he had formerly used in experimenting on the combustion of the diamond, and consisting of two mercurial gasometers, with the addi-

* A notice of Mr. Wharton Jones's communication appeared in the Number for May last.

tion of two hemispheres of glass closely joined together at their bases, so as to form an air-tight globular receptacle for the plant subjected to experiment.

The general conclusions he deduces from his numerous experiments conducted during several years, are, first, that in leaves which are in a state of vigorous health, vegetation is always operating to restore the surrounding atmospheric air to its natural condition, by the absorption of carbonic acid and the disengagement of oxygenous gas: that this action is promoted by the influence of light, but that it continues to be exerted, although more slowly, even in the dark. Secondly, that carbonic acid is never disengaged during the healthy condition of the leaf. Thirdly, that the fluid so abundantly exhaled by plants in their vegetation is pure water, and contains no trace of carbonic acid. Fourthly, that the first portions of carbonic acid gas contained in an artificial atmosphere, are taken up with more avidity by plants than the remaining portions; as if their appetite for that *tabulum* had diminished by satiety.

“On the minute structure of the Skeletons, or hard parts of Invertebrata.” By W. B. Carpenter, M.D. Part II. “On the structure of the Shell in the several families and genera of Mollusca.”

The author here gives in detail the results of his inquiries into the combinations of the component elements of shell as they are met with in the several families and genera of the Mollusca; and considers all these results as tending to establish the general proposition, that where a recognizable diversity presents itself in the elementary structure of the shell, in different groups, that diversity affords characters which indicate the natural affinities of the several genera included in those groups, and which may therefore be employed with advantage in classification, and in the recognition and determination of fossils.

June 15.—“On the supposed developement of the Animal Tissues from Cells.” By James Stark, M.D., F.R.S.E.

The author controverts the prevailing theory of the developement of animal tissues from cells, and denies the accuracy of the microscopical observations on which that theory is founded, as regards the anatomy of the adult as well as of the foetal tissues. He asserts that at no period of foetal life can rows of cells be discovered in the act of transformation into muscular fibres: and he denies that these fibres increase either in length or in thickness by the deposition of new cells. He contends that the ultimate filaments of muscles, as well as all the other tissues of the body, are formed from the fibrinous portion of the blood, which is itself composed of globules that are disposed to cohere together, either in a linear series, so as to form a net-work of fine filaments, or in aggregated masses of a form more or less globular, composing what have been termed fibrinous corpuscles. These corpuscles have been considered to be the nuclei of cells; but the author regards them as being merely accidental fragments of broken down tissues, adhering to the filaments, and noways concerned in their developement. The more regularly disposed granules, which are observed to occupy the spaces intervening

between the filaments composing the ordinary cellular tissue, he considers as being fatty matter deposited within these spaces. He, in like manner, regards the observations tending to show the cellular origin of the fibrous, cartilaginous, and osseous tissues, as altogether fallacious; and maintains that the cells, which these animal textures exhibit when viewed under the microscope, are simply spaces occurring in the more solid substance of these structures, like the cavities which exist in bread. These views are pursued by the author in discussing the formation of the skin, the blood-vessels, and the nerves, and in controverting the theory of secretion, founded on the action of the interior surfaces of the membranes constituting cells.

“On the Organ of Hearing in Crustacea.” By Arthur Farre, M.D., F.R.S.

The author finds that in the Lobster (*Astacus marinus*), the organ of hearing consists of a transparent and delicate vestibular sac, which is contained in the base, or first joint of the small antennæ; its situation being indicated externally by a slight dilatation of the joint at this part, and also by the presence of a membrane covering an oval aperture, which is the fenestra ovalis. The inner surface of the sac gives origin to a number of hollow processes, which are covered with minute hairs and filled with granular matter, apparently nervous. A delicate plexus of nerves, formed by the acoustic nerve, which is a separate branch supplied from the supra-œsophageal ganglion, is distributed over the base of these processes and around the sac. Within the sac there are always found a number of particles of siliceous sand, which are admitted, together with a portion of the surrounding water, through a valvular orifice at the mouth of the sac, being there placed apparently for the express purpose of regulating the size of the grains. The author considers these siliceous particles as performing the office of otolites, in the same way as the stones taken into the stomachs of granivorous birds supply the office of gastric teeth. Several modifications of this structure exhibited in the organs of hearing of the *Astacus fluviatilis*, *Pagurus streblonyx*, and *Palinurus quadricornis* are next described, and an explanation attempted of the uses of the several parts and their subserviency to the purposes of that sense.

The author concludes by a description of another organ situated at the base of the large antennæ, which it appears has been confounded with the former by some anatomists, but which the author conjectures may possibly constitute an organ of smell. The paper is accompanied by illustrative drawings.

MISCELLANEOUS.

ADDENDA AND EMENDATIONS TO MR. E. BLYTH'S LIST OF BIRDS OBTAINED IN THE VICINITY OF CALCUTTA.

To Richard Taylor, Esq.

Calcutta, May 12, 1843.

MY DEAR SIR,—The last month has been a very productive one to me, in various classes of animals, and among the rest in that of